

28. STUDY OF MALE GENITALIA OF SOME SPECIES GENUS OF *PHEROPSOPHUS* (BRANCHININI: CARABIDAE: COLEOPTERA) AND ITS TAXONOMIC IMPORTANCE

(With three text-figures)

Pheropsophus (Soiler), commonly known as the bombardier beetle, is widely distributed in India. Andrews (1935) placed it under the subfamily Harpalinae. In recent taxonomic studies considerable importance has been given to genitalia (Sewak 1985). However, male genitalia of *Pheropsophus* has not been studied. The male genitalia of three species, namely *P. catoirei* (Deg.), *P. heloris* (Fal.) and *P. lineifrons* (Chaud.) have been described and illustrated in this paper.

MATERIALS AND METHODS

Specimens of *Pheropsophus catoirei* (Degean), *P. heloris* (Failer) and *P. lineifrons* (Chaud.) were collected from different forests, rural and urban localities of western Uttar Pradesh. To study the male genitalia, dried and live specimens were used. The dried specimens were placed in boiling water and their abdomens treated with 10% KOH solution overnight, were dissected out to expose the genitalia and mounted in Canada balsam. The drawings were made with the help of camera lucida attachment.

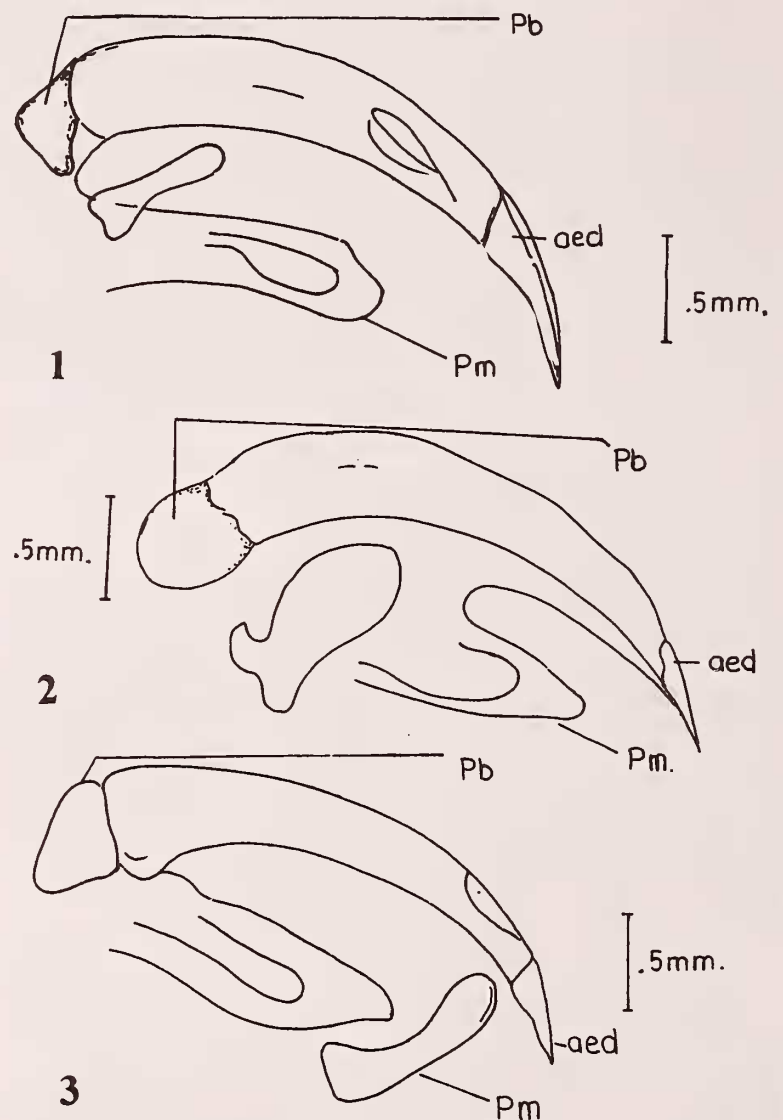
Observations: The structure of phallobase, aedeagus and parameres (Tuxen 1956) of all the three species reported here greatly differed and the main differences are as follows:

Pheropsophus catoirei (Degean): Aedeagus slender and narrow at the apex, well arcuate, rather abruptly bent near the base than almost straight; phallobase short, triangular and broad in the middle; parameres elongated, right paramere narrow, sides sub-parallel and rounded at apex, left paramere rounded at the apex basically broad and bilobed (Fig. 1).

P. heloris (Failer): Aedeagus small, pointed, at the apex, bent near the base; phallobase rounded, broad in the middle; left paramere oval, broad, rounded at the apex, right paramere narrow, sides sub-parallel and pointed at the apex (Fig. 2).

P. lineifrons (Chaud.) (Fig. 3): Aedeagus long,

straight, pointed at the apex, broadly towards the base; phallobase triangular, broad in the middle; left paramere narrow, sides sub-parallel and pointed at the apex, right paramere oval, obtusely pointed at apex.



Male Genitalia of *Pheropsophus* (1 mm=3 cm):
Fig. 1. *P. catoirei*; Fig. 2. *P. heloris*; Fig. 3. *P. lineifrons*.
Abbreviations: Aed: Aedeagus; Pb: Phallobase;
Pm: Paramere.

KEY TO IDENTIFY SOME OF THE INDIAN SPECIES BASED ON MALE GENITALIA

1. Parameres elongated, pointed proximally; Phallobase oval; Aedeagus elongated *catoirei* (Deg.)
- Parameres not elongated, phallobase rounded, aedeagus not elongated 2
2. Parameres rounded in the middle; Phallobase triangular shaped; Aedeagus small *heloris* (Failer)

3. Parameres broad in the middle, phallobase oval, aedeagus pointed *lineifrons* (Chaud.)

TAXONOMIC IMPORTANCE

The oval shaped parameres and long pointed aedeagus of male genitalia of genus *Pheropsophus* show resemblance to other genera of Harpalini, whereas the structure of parameres and aedeagus greatly differs at both generic and species levels. Parameres of *Chlaenius* are elongated, and narrow whereas they are elongated and hairy in *Trechus* and *Tachys*, and pointed and with bristles in *Abacetus*. Aedeagus of *Diplocheila* is broad apically and narrow proximally. The oval shaped paramere and long pointed aedeagus of the studied species

of the genus *Pheropsophus* resemble and show similarities with those of other genera of the family Carabidae.

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29. CILIATE INFESTATION ON THE PHYTAL HALACARIDAE (ACARI) FROM THE KOVALAM BEACH (KERALA COAST)

The epibiotic ciliate infestation on the macrofaunal assemblages of Pelagial, benthal and phytal realms in the marine environment are well known. However, the epibiotic ciliate infestations on the meiofauna and their impact on the eco-biology of the meiofauna are less known.

Hagerman (1966, *Ophelia* 3: 1-43) reported an unidentified species of Halacaridae (Acari) infested by ciliates found among the phytal sediments of *Fucus serratus* from Oresund.

While studying the phytal meiofauna from the Kovalam beach (Kerala coast), some halacarids were observed to be heavily infested by peritrichous ciliates and are reported here. The present observation is of relevance in the ecobiology of the phytal Halacaridae which are known to serve as food for higher trophic levels in the littoral environments.

TABLE I
PERCENTAGE COMPOSITION OF CILIATE
INFESTATION IN DIFFERENT HALACARID SPECIES

Name of Species	July 1987	October 1987
<i>Rhombognathus scuttutus</i>		
Male	40	30
Female	15	13
<i>R. papuensis</i>		
Male	5	40
Female	40	17
<i>Rhombognathus</i> nymphs and larvae	0	0
<i>Copidognathus</i> spp.	0	0
	0	0
<i>Agauopsis brevipalpus brevipalpus</i>	0	0

Among different species of Halacaridae, many *Rhombognathus scuttutus* and *R. papuensis* were